IN THE CLAIMS

Please change the following claims to read as follows:

Claim1 (currently amended): A spin valve device comprising:

a gap layer,

a single buffer layer having a top surface ~~and which is composed of~~ comprising a layer of a single refractory material formed on the top surface of the gap layer,

patterned underlayers formed directly over the buffer layer including layers selected from ~~the group consisting of~~ as follows:

a first group ~~consisting of~~ comprising a lower antiferromagnetic layer stacked with a ferromagnetic layer, and

a second group ~~consisting of~~ comprising a chromium layer stacked with a permanent magnetic layer plus an optional conductor layer,

an inwardly tapered depression formed extending through the patterned underlayers down to the surface of the buffer layer,

a stack of layers formed covering the patterned underlayers and reaching down to cover the inwardly tapered depression including:

a free layer,

a spacer layer,

a pinned layer,

an upper antiferromagnetic layer, and

conductors formed either on the surface of the upper antiferromagnetic layer aside from the depression or between the buffer layer and the patterned underlayers,

whereby the patterned underlayers which are located aside from the inwardly tapered depression provide trackwidth and longitudinal bias.

Claim 2 (previously presented): The device of claim 1 wherein the underlayers include an antiferromagnetic material selected from the group consisting of IrMn, RhMn, RuMn, RuRhMn, FeMn, FeMnRh, FeMnCr, CrPtMn, TbCo, NiMn, PtMn, PtPdMn, NiO, CoO, and CoNiO.

Claim 3 (canceled)

Claim 4 (currently amended): The device of claim 1 wherein the buffer layer consists of a material selected from the group consisting of Nb, Ta, Ti, Zr, Hf, Mo, and W.

Claim 5 (previously presented): The device of claim 1 wherein the ferromagnetic layer in the first group consists of at least one material selected from the group consisting of Co, CoFe, Ni, and NiFe.

Claim 6 (currently amended): The device of claim 1 wherein [[a]] the conductor layer is provided consisting of a material selected from the group consisting of Au, Ag, W, Mo, Rh, Ru, Ti, ß-Ta, TiW, TaW, and $Cu_{50}Au_{50}$.

Claims 7- 44 (canceled)

Claim 45 (previously presented): A spin valve device comprising:

a gap layer,

a buffer layer having a top surface and comprising a single layer of a refractory material formed on the top surface of the gap layer,

patterned underlayers formed on the buffer layer including:

a) a lower antiferromagnetic layer formed on the buffer layer,

b) a thin ferromagnetic layer formed on the lower antiferromagnetic layer,

an inwardly tapered depression in the patterned underlayers down to the surface of the buffer layer,

a stack of layers formed covering the patterned underlayers and reaching down to cover the inwardly tapered depression including:

c) a free layer,

d) a spacer layer,

e) a pinned layer,

f) an upper antiferromagnetic layer,

whereby the patterned underlayers, which are located aside from the inwardly tapered

depression, provide trackwidth and longitudinal bias.

Claim 46 (previously presented): The device of claim 45 wherein the lower antiferromagnetic material is selected from the group consisting of IrMn, RhMn, RuMn, RuRhMn, FeMn, FeMnRh, FeMnCr, CrPtMn, TbCo, NiMn, PtMn, PtPdMn, NiO, CoO, and CoNiO.

Claim 47 (previously presented): The device of claim 45 wherein the buffer layer consists of a material selected from the group consisting of Nb, Ta, Ti, Zr, Hf, Mo, W.

Claim 48 (previously presented): The device of claim 45 wherein the ferromagnetic layer consists of at least one material selected from the group consisting of Co, CoFe, Ni, and NiFe.

Claim 49 (currently amended): The device of claim 45 wherein [[a]] the conductor layer is provided consisting of a material selected from the group consisting of Au, Ag, W, Mo, Rh, Ru, Ti,ß- Ta, TiW, TaW, and $Cu_{50}Au_{50}$.

Claim 50 (currently amended): The device of claim 45 wherein [[a]] an additional conductor layer with reduced electrical lead resistance formed above the upper antiferromagnetic layer aside from the trackwidth was added and aligned after spin valve deposition.

Claim 51 (previously presented): A spin valve device comprising:

a gap layer,

a buffer layer having a top surface and which is composed of a refractory material formed over the gap layer,

patterned underlayers formed on the buffer layer including:

a) a thin ferromagnetic layer formed on the buffer layer,

b) a lower antiferromagnetic layer formed on the thin ferromagnetic layer,

an inwardly tapered depression in the patterned underlayers down to the surface of the buffer layer,

a stack of layers formed covering the patterned underlayers and reaching down to cover the inwardly tapered depression including:

c) a free layer,

d) a spacer layer,

e) a pinned layer,

f) an upper antiferromagnetic layer,

whereby the patterned underlayers, which are located aside from the inwardly tapered depression, provide trackwidth and longitudinal bias.

Claim 52 (previously presented): The device of claim 51 wherein the lower antiferromagnetic material is selected from the group consisting of IrMn, RhMn, RuMn, RuRhMn, FeMn, FeMnRh, FeMnCr, CrPtMn, TbCo, NiMn, PtMn, PtPdMn, NiO, CoO, and CoNiO.

Claim 53 (previously presented): The device of claim 51 wherein the buffer layer consists of a material selected from the group consisting of Nb, Ta, Ti, Zr, Hf, Mo, W.

Claim 54 (previously presented): The device of claim 51 wherein the ferromagnetic layer consists of at least one material selected from the group consisting of Co, CoFe, Ni, and NiFe.

Claim 55 (currently amended): The device of claim 51 wherein [[a]] the conductor layer is provided consisting of a material selected from the group consisting of Au, Ag, W, Mo, Rh, Ru, Ti,ß- Ta, TiW, TaW, and $Cu_{50}Au_{50}$.

Claim 56 (currently amended): The device of claim 51 wherein [[a]] an additional conductor layer with reduced electrical lead resistance formed above the upper antiferromagnetic layer aside from the trackwidth was added and aligned after spin valve deposition.

Claim 57 (currently amended): A spin valve device comprising:

a gap layer,

a single buffer layer having a top surface and which is composed of a layer of a single refractory material formed on the top surface of the gap layer,

patterned underlayers formed ~~directly~~ over the buffer layer consisting of a stack of a conductor layer covered by a lower antiferromagnetic layer covered by a ferromagnetic layer,

an inwardly tapered depression formed extending through the patterned underlayers down to the surface of the buffer layer,

a stack of layers formed covering the patterned underlayers and reaching down to cover the inwardly tapered depression including:

a free layer,

a spacer layer,

a pinned layer,

an upper antiferromagnetic layer having a top surface, and

an additional conductor[[s]] formed either on the top surface of the upper antiferromagnetic layer aside from the depression, ~~or between the buffer layer and the patterned underlayers,~~

whereby the patterned underlayers which are located aside from the inwardly tapered depression provide trackwidth and longitudinal bias.

Claim 58 (currently amended): A spin valve device comprising:

a gap layer,

a single buffer layer having a top surface and which is composed of a layer of a single refractory material formed on the top surface of the gap layer,

patterned underlayers formed ~~directly~~ over the buffer layer consisting of a stack of a conductor layer, covered by a chromium layer covered in turn by a permanent magnetic layer,

an inwardly tapered depression formed extending through the patterned underlayers down to the surface of the buffer layer,

a stack of layers formed covering the patterned underlayers and reaching down to cover the inwardly tapered depression including:

a free layer,

a spacer layer,

a pinned layer,

an upper antiferromagnetic layer <u>having a top surface</u>, and

<u>an additional</u> conductor[[s]] formed either on the <u>top</u> surface of the upper antiferromagnetic layer aside from the depression, ~~or between the buffer layer and the patterned underlayers,~~

whereby the patterned underlayers which are located aside from the inwardly tapered depression provide trackwidth and longitudinal bias.

Claim 59 (currently amended): [[A]] The spin valve device of claim 57 wherein ~~comprising:~~

~~a gap layer;~~

~~a single buffer layer having a top surface and which is composed of a layer of a single refractory material formed on the top surface of the gap layer;~~

~~patterned underlayers formed directly over the buffer layer consisting of a stack of a conductor layer covered by a lower antiferromagnetic layer covered by a ferromagnetic layer;~~

[[an]] the inwardly tapered depression ~~formed extending through the patterned underlayers down to the surface of the buffer layer which~~ has a recessed upper surface at the bottom of the depression. [[,]]

~~a stack of layers formed covering the patterned underlayers and reaching down to cover the inwardly tapered depression including:~~

~~a free layer;~~

~~a spacer layer;~~

~~a pinned layer;~~

~~an upper antiferromagnetic layer, and~~

~~conductors formed either on the surface of the upper antiferromagnetic layer aside from the depression or between the buffer layer and the patterned underlayers;~~

~~whereby the patterned underlayers which are located aside from the inwardly tapered depression provide trackwidth and longitudinal bias.~~

Claim 60 (currently amended): [[A]] The spin valve device of claim 58 wherein ~~comprising:~~

~~a gap layer;~~

~~a single buffer layer having a top surface and which is composed of a layer of a single refractory material formed on the top surface of the gap layer;~~

~~patterned underlayers formed directly over the buffer layer consisting of stacked of a conductor layer covered by a chromium layer covered by a permanent magnetic layer~~,

[[an]] the inwardly tapered depression ~~formed extending through the patterned underlayers down to the surface of the buffer layer which~~ has a recessed upper surface at the bottom of the depression. [[,]]

~~a stack of layers formed covering the patterned underlayers and reaching down to cover the inwardly tapered depression including:~~

~~a free layer;~~

~~a spacer layer;~~

~~a pinned layer;~~

~~an upper antiferromagnetic layer, and~~

~~conductors formed either on the surface of the upper antiferromagnetic layer aside from the depression or between the buffer layer and the patterned underlayers;~~

~~whereby the patterned underlayers which are located aside from the inwardly tapered depression provide trackwidth and longitudinal bias.~~

Claim 61 (canceled)